Networking your world

NM-102KIT
MEDIA CONVERTER SERIES
USER'S MANUAL

Http://www.netsys.com.tw

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Maximum signal rate derived from IEEE Standard specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Netsys does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose. Make sure you follow in line with the environmental conditions to use this product.

Foreword

The NM-102 A20/B20 is a WDM Ethernet media converter that translates transmission signals from a twisted-pair 100BASE-TX cable to 100BASE-FX fiber optic cable. NM-102 A20 is for CO side. NM-102 B20 is for CPE side. It expands network data transmission distances beyond the 100 meters limitation of copper wire to a maximum of 20 km by using single fiber optic cable in 100 Mbps.

The NM-102 A20/B20 provides auto-sensing detection of full duplex or half duplex signaling. It has easy-to-read diagnostic LED for continuous status reports on network speed, duplex media access control connection, and network traffic. The NM-102 A20/B20 uses standard RJ-45 UTP/STP and SC fiber optic connectors and is IEEE 802.3u 100BASE-TX/FX compliant and operates with all devices that adhere to this standard.

Attention:

Be sure to read this manual carefully before using this product. Especially Legal Disclaimer, Statement of Conditions and Safety Warnings.

Caution:

The NM-102 A20/B20 is for **indoor** applications only. This product does not have waterproof protection, please do not use in outdoor applications.

Safety Warnings

For your safety, be sure to read and follow all warning notices and instructions before using the device.

- **DO NOT** open the device or unit. Opening or removing the cover may expose you to dangerous high voltage points or other risks. ONLY qualified service personnel can service the device. Please contact your vendor for further information.
- **Use ONLY** the dedicated power supply for your device. Connect the power to the right supply voltage (110V AC used for North America and 230V AC used for Europe. NM-102 supports 5 VDC power input).
- **Place** connecting cables carefully so that no one will step on them or stumble over them. DO NOT allow anything to rest on the power cord and do NOT locate the product where anyone can work on the power cord.
- **DO NOT** install nor use your device during a thunderstorm. There may be a remote risk of electric shock from lightning.
- **DO NOT** expose your device to dampness, dust or corrosive liquids.
- **DO NOT** use this product near water, for example, in a wet basement or near a swimming pool.
- **Connect ONLY** suitable accessories to the device.
- **Make sure** to connect the cables to the correct ports.
- **DO NOT** obstruct the device ventilation slots, as insufficient air flow may harm your device.
- **DO NOT** place items on the device.
- **DO NOT** use the device for outdoor applications directly, and make sure all the connections are indoors or have waterproof protection place.
- **Be careful** when unplugging the power, because it may produce sparks.
- **Keep** the device and all its parts and accessories out of the reach of children.
- **Clean** the device using a soft and dry cloth rather than liquid or atomizers. Power off the equipment before cleaning it.
- This product is **recyclable**. Dispose of it properly.

Contents

Copyright 1
Foreword 2
Safety Warnings 3
Chapter 1. Unpacking Information 5
1.1 Check List 5
Chapter 2. Hardware Description 6
2.1 Front Panel 7
2.2 Rear Panel 7
2.3 LED Indicators 8
2.4 Installation 9
Appendix A: Product Specification 10
Appendix B: Troubleshooting 13
Appendix C: Compliance and Safety Information 14
Warranty 17
Chinese SJ/T 11364-2006 18

Chapter 1. Unpacking Information

1.1 Check List

Thank you for choosing Netsys NM-102. Before installing the router, please verify the contents inside the package.

Package Contents:

1. NM-102 A20 x 1
2. NM-102 B20 x 1
3. AC to DC (5V) Power Adaptor x 2

Notes:

1. Please inform your dealer immediately for any missing or damaged parts. If possible, retain the carton including the original packing materials. Use them to repack the unit in case there is a need to return for repair.
2. If the product has any issue, please contact your local vendor.
3. Do not use sub-standard power supply. Before connecting the power supply to the device, be sure to check compliance with the specifications. The NM-102 uses a DC 5V/1A power supply.
4. The power supply included in the package is commercial-grade. Do not use in industrial-grade applications.
5. Please look for the QR code on the bottom of the product, the user can launch the QR code scanning program to scan and download the user's manual electronic format file.

Chapter 2. Hardware Description

This section describes the important parts of the converter. It features the front and rear panel.

NM-102KIT Outward

2.1 Front Panel

1. WDM Mode
2. LED Indicators
3. 10/100Mbps ETHERNET Port

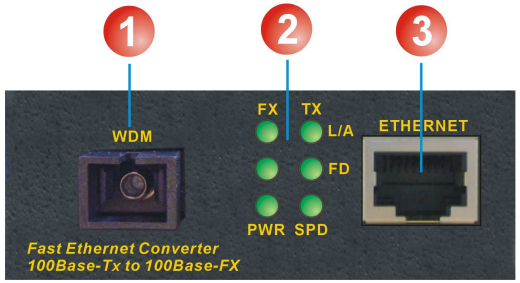


Figure 2.1 NM-102's front panel

2.2 Rear Panel

1. Power Jack(DC 5V In)

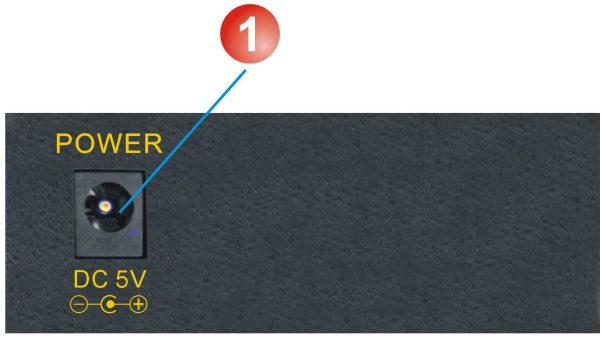
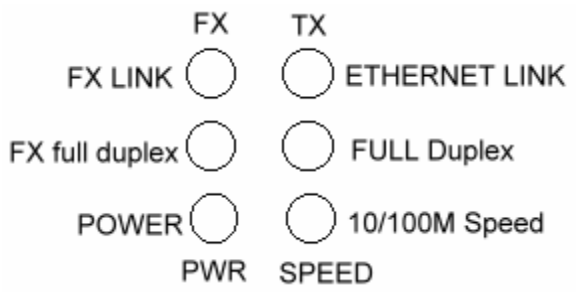


Figure 2.2 NM-102's rear panel

2.3 LED Indicators



FX			
LEDs	**Color**	**Status**	**Descriptions**
FX LINK	Green	ON	Optic fiber is connected
FX full duplex	Green	ON	Full Duplex
POWER/PWR	Green	ON	5-V power is turned on

TX			
LEDs	**Color**	**Status**	**Descriptions**
ETHERNET LINK	Green	ON	RJ-45 Ethernet is connected
FX full duplex	Green	ON	Full Duplex
10/100M Speed	Green	ON	100M Speed

2.4 Installation

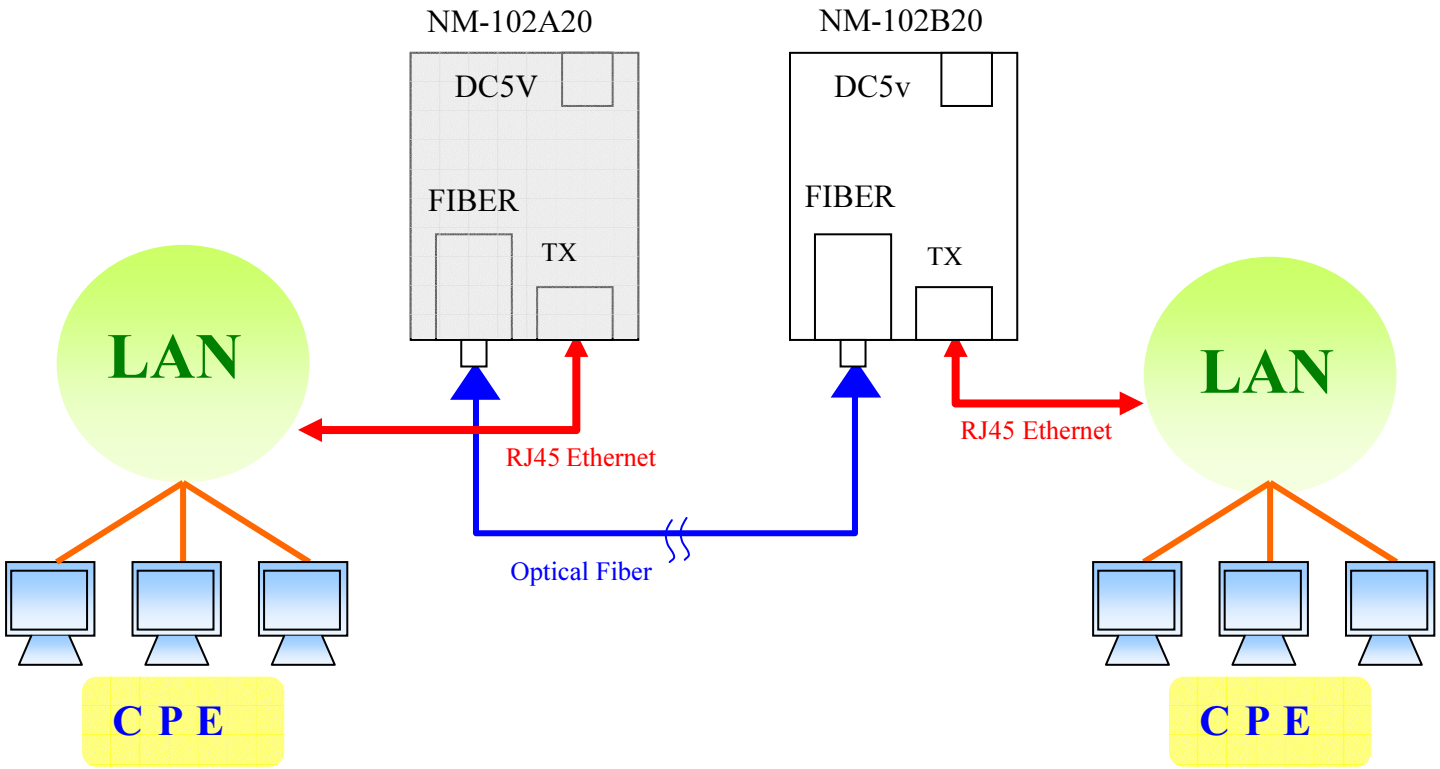


Figure 2.3 Applicaiotn diagram

Appendix A: Product Specification

Key Features:

1. Support auto-MDIX and 10/100Base T for RJ-45 port
2. Complies with IEEE 802.3 for 10BaseT/802.3u for 100Base-TX and 100Base-FX.
3. Supports WDM duple mode for TX/RX on single fiber cable
4.Compact in size, easy installation
5. Data Transfer Rate: 100Mbps
6. Duplex mode support: Full or half-duplex mode by Auto-Negotiation
7. LED indicators: PWR, LNK/ACT, SPD, FDX for copper RJ-45 LINK/ACT, FDX for Fiber optic.
8. Fiber: Single Mode: 8.3/125, 8.7/125, 9/125μm optic fiber and up to 20km
9. EMI certified by CE, FCC
10. External Power Adapter:Input:AC 85~240 volts/50~60Hz.Output:DC 5V/1A

Specification:

Model:	NM-102A	NM-102B
Protocol and Standards:	IEEE802.3 & IEEE802.3u	
Maximum Speed:	Full Duplex: 200Mbps for 100Base-Tx	
	Half Duplex: 100Mbps for 100Base-Tx	
Cabling:	Ethernet: 100Base-TX 2 pair Cate.5 UTP Cable	
	Fiber: Single Mode 8.3/125, 8.7/125, 9/125μm	
Modes:	Full or half-duplex mode, Auto-Negotiation	
Packet Forwarding Rate (64Bytes):	14880pps@10Mbps / 148800pps@100Mbps	
Connector:	Copper: RJ-45	
	Fiber: Single SC-type connector	
TX Optical Frequency:	1550nm(1480~1580nm)	1310nm(1260~1360nm)
	1310nm(1260~1360nm)	1550nm(1480~1580nm)
Max. / Min. Optical Launch Power:	–8dBm / -14dBm	
Optical Receive Sensitivity:	–31dBm	
Operating Temperature:	0°C ~ 50°C (32°F ~ 122°F)	
Storage Temperature:	-20°C ~ +65°C (-4°F ~ 149°F)	
Humidity:	Up to 90% (non-condensing)	
Dimension:	70(W) x 94(L) x 26(H) mm	

Specification for optic fiber

Type	Specification
Single-Mode Fiber (SMF)	diameter：10/25μm wavelength: 1300 (1270~1355)nm
Multi-Mode Fiber (MMF)	diameter：62.5/125μm wavelength 850 (1270~1355) nm diameter：62.5/125μm wavelength 1300 (1270~1355)nm

Notes:

1. NM-102KIT of acceptable db loss of the fiber-optic cable connected is 18dBm.
2. NM-102 dose not accept SC/APC (angle-polished connectors) connector. NM-102 can accept SC/UPC (ultra-polished connectors) connector.

Appendix B: Troubleshooting

Diagnosing Media Converter Indicators

The Media Converter can be easily monitored through its comprehensive panel indicators. These indicators assist in identifying problems the Media Converter may encounter. This section describes common problems you may encounter and possible solutions

1. Symptom:	POWER indicator does not light up (green) after power on.
Cause:	Defective power outlet, power cord, internal power supply
Solution :	Cheek the power outlet by plugging in another that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, have the unit power supply replaced by an qualified distributor.

2. Symptom:	Link indicator does not light up (green) after making a connection.
Cause:	Network interface (e.q., a network adapter card on the attached device, network cable) or switch port is defective.
Solution :	◆ Verify if both of the switch and attached device are powered on. ◆ Be sure the cable is plugged into both the switch and corresponding device. ◆ Verify that the proper cable type is used and its length does not exceed specified limits. ◆ Check the adapter on the attached device and cable connections for possible defects. ◆ Replace the defective adapter or cable if necessary.

3. Question:	Can you please find out what the maximum transmit unit (MTU) is for the NM-102 units?
Answer:	The MTU for the NM-102 is 1600 bytes.

Appendix C: Compliance and Safety Information

FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a computing device, pursuant to Part 15 of FCC class A rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. The equipment and the receiver should be connected to outlets on separate circuits.
4. Consult the dealer or an experienced radio/television technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

If this telephone equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the

proper functioning of your equipment. If they do, you will be notified in advance in order for you to make necessary modifications to maintain uninterrupted service.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Important Safety Instructions

- **Caution:** The direct plug-in wall transformer serves as the main product for disconnecting. The socket outlet shall be installed near the product and be readily accessible.
- **Caution:** Use only the power supply included with this product. In the event the power supply is lost or damaged:In the United States, use only with CSA certified or UL listed Class 2 power supply, rated **5Vdc 1A** or above.
  IN Europe, use only with CE certified power supply, rated **5Vdc 1A** or above.
- **Do not** use this equipment near water, for example in a wet basement.
- **Avoid** using a telephone during an electrical storm. There may be a remote risk of electrical shock from lightning.
- **Do not** use the telephone to report a gas leak in the vicinity of the leaking area.
- If you experience trouble with this unit, please contact customer service of your dealer immediately.
- **DO NOT DISASSEMBLE THIS EQUIPMENT**. It does not contain any user serviceable components.

FCC Warning

This equipment has been tested to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment can generate, use, and radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at owner's expense.

CE Mark Warning

This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Warranty

The original owner that the product delivered in this package will be free from defects in material and workmanship for one year parts after purchase. For the warranty to apply, you must register your purchase by returning the registration card indicating the date of purchase.

There will be a minimal charge to replace consumable components, such as fuses, power transformers, and mechanical cooling devices. The warranty will not apply to any products which have been subjected to any misuse, neglect or accidental damage, or which contain defects which are in any way attributable to improper installation or to alteration or repairs made or performed by any person not under control of the original owner.

The above warranty is in lieu of any other warranty, whether express, implied, or statutory, including but not limited to any warranty of merchantability, fitness for a particular purpose, or any warranty arising out of any proposal, specification, or sample. We shall not be liable for incidental or consequential damages. We neither assume nor authorize any person to assume for it any other liability.

WARNING:

1. DO NOT TEAR OFF OR REMOVE THE WARRANTY STICKER AS SHOWN, OR THE WARRANTY IS VOID.

2. WARRANTY VOID IF USE COMMERCIAL-GRADE POWER SUPPLY IS USED AT HARSH ENVIRONMENTS.

Chinese SJ/T 11364-2006

部件名称	有 毒 有 害 物 质 或 元 素					
	铅(Pb)	汞(Hg)	镉(Cd)	六价铬[Cr(VI)]	多溴联苯(PBB)	多溴二苯醚(PBDE)
结构壳体	○	○	○	○	○	○
电路组	○	○	○	○	○	○
电源供应器	○	○	○	○	○	○
包装及配件	○	○	○	○	○	○

○：表示该有毒物质在该部件所有均质材料中的含量均在 SJ/T 11364/2006 标准规定的限量要求以下。

╳：表示该有毒物质至少在该部件的某依均质材料中的含量超出 SJ/T 11364-2006 标准规定的限量要求。

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